51206/KMO/A467

KNIFE WITH SLIDABLE BLADE PROTECTOR

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Patent Application No. 60/423,742, filed November 5, 2002, the entire disclosure of which is incorporated herein by reference.

BACKGROUND

Knives with mechanisms for protecting the knife blade when not in use are known. Some of these knives are of a folding variety, with a blade that pivots from an open position to a folded position where the blade is protected within an opening in the knife handle, such as a common folding pocketknife. Another type of protecting mechanism allows for retraction of the knife blade. In this variety the knife blade can be moved from an open position which has the blade extended from the knife handle, to a closed position which has the blade disposed within an opening within the knife handle, and where the movement of the knife is substantially linear.

For some applications, the folding and retractable designs are acceptable. However, for other applications, these designs are less desirable. For example, for scoring dough, it is advantageous for the knife to have a smooth bottom surface to avoid tearing of the dough. A scoring knife with such a design is described in U.S. Patent No. 6,487,948, the disclosure of which is incorporated herein by reference. If the knife blade of the scoring knife can be folded or retracted, the bottom surface of the knife will not be smooth, thus making the knife less desirable for scoring.

Accordingly, a need exists for a knife having a non-folding and non-retractable blade but that includes a mechanism for protecting the knife blade when not in use.

SUMMARY OF THE INVENTION

The present invention is directed to a knife having a sliding blade cover to protect the knife blade when not in use. In one embodiment, the knife comprises a knife body having a top edge, a bottom edge, a proximal edge, a distal edge and a midsection between the top, bottom, proximal and distal edges. A slot extends at least a part of the way through the midsection along the length of the knife body. A knife blade extends from the bottom edge of the knife body. A blade cover is slidably mounted in the slot. The blade cover has at least one top portion that extends into the slot and two downwardly extending side portions attached to the at least one top portion. The blade cover is moveable within the slot between a first position where the two downwardly extending side portions cover the left and right sides of the blade and a second position where the two downwardly extending side portions do not cover the sides of the blade.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the present invention will be better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a side view of a knife according to the invention where the knife blade is covered by a blade cover.

FIG. 2 is a side view of the knife of FIG. 1 wherein the blade cover is moved away from the blade to expose the blade.

FIG. 3 is a side view of the knife of FIG. 1 without the blade cover.

FIG. 4 is a side view of the inside surface of one of the side portions of the blade cover of the knife of FIG. 1.

FIG. 5 is a side view of the inside surface of the other side portion of the blade cover of the knife of FIG. 1.

FIG. 6 is an end cross-sectional view of the knife of FIG. 1 along line 6-6.

FIG. 7 is a side view of an alternative knife according to the invention where the knife blade is covered by a blade cover.

FIG. 8 is a side view of the knife of FIG. 7 wherein the blade cover is moved away from the blade to expose the blade.

FIG. 9 is an end cross-sectional view of the knife of FIG. 7.

FIG. 10 is an end cross-sectional view of an alternative knife according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a knife having a slidable blade protector. As shown in Figures 1 to 3, the knife **12** includes an elongated body **14** at its distal end having a blade **18** extending downwardly therefrom and a handle **16** at its proximal end for the user to grip the knife. The elongated body **14** includes a top edge **20**, a bottom edge **22**, a proximal edge **24**, a distal edge **26** and a midsection **28** between the top, bottom, proximal and distal edges. In the depicted embodiment, the distal edge **26** is curved and extends beyond the distal end of the blade **18**, as best shown in FIGs. 2 and 3. The body **14** also includes a right side **27** and a left side **29**, as best shown in FIG. 6, that define the width of the body. The knife **12** can be made of any suitable material, and is preferably made of plastic.

The precise shape of the knife is not critical to the invention. In the embodiment shown in FIGs. 1 to 3, the knife body **14** is generally triangular with rounded edges, and the handle **16**, which extends generally diagonally from the distal end of the top edge **20** of the body, is generally rectangular with a rounded proximal end. This shape is desirable because, in use, the body **14** is closer to the object being cut, and the handle **16** is spaced sufficiently above the object being cut so that the user can grip the handle and have one or more fingers wrapped around or tucked under the handle, thereby permitting the user to

apply necessary pressure on the knife. Other knife shapes are considered within the scope of the invention.

The size of the knife **12** is not critical and can vary depending on the application. The elongated body **14** has a length preferably ranging from about 6 cm to about 15 cm, more preferably from about 8 cm to about 12 cm. The handle **16** has a length preferably ranging from about 4 cm to about 10 cm, more preferably from about 5 cm to about 7 cm. The width of the midsection **28** of the body **12** preferably ranges from about 1 mm to about 5 mm, more preferably from about 2 mm to about 3 mm. Preferably one or more, and more preferably all, of the top edge **20**, bottom edge **22**, proximal edge **24**, and distal edge **26** has a width slightly greater than the width of the midsection, for example, 1 to 5 mm greater than the width of the midsection.

The knife blade **18** has a maximum exposed height (i.e., a height that extends outside of the knife body **14**) preferably ranging from about 3 mm to about 20 mm, more preferably from about 5 mm to about 10 mm. More preferably, the bottom edge **22** of the knife body **14** curves upward at its distal end so that the height of the exposed portion of the knife blade **18** is greatest at its distal end and decreases toward the proximal end of the exposed portion, as best shown in FIGs. 2 and 3. With this design, the extent to which the user tilts the knife during cutting will affect the depth that the blade **18** enters the surface being cut.

The blade can be made of any suitable material, such as stainless steel, and is preferably provided with a Teflon coating. The knife blade **18** is preferably fixedly attached to the knife body so that it is not moveable relative to the body.

The knife **12** includes an elongated slot **30** extending through the midsection **28** along a portion of the length of the body **14** so that the slot does not contact either the proximal edge **24** or the distal edge **26**, as best shown in

FIG. 3. In the depicted embodiment, the slot **30** extends all the way through the width of the knife, as best shown in FIG. 6.

A blade cover **32** is slidably mounted in the slot **30**. The blade cover **32** can be made of any suitable material, such as plastic or metal. In the embodiment of FIGs. 1 to 3, the blade cover **32** includes a top portion **34** that extends through the slot **30** and two downwardly extending side portions **36** that extend from the slot and along the right and left sides **27** and **29** of the knife body, as best shown in FIG. 6, so that inner surfaces **35** of the side portions face the left and right sides of the knife body and outer surfaces **37** of the side portions face away from the knife body.

More particularly, each side portion **36** comprises an outer body **38** defining an inner opening **40** in which an inner body **42** is hingedly mounted to the outer body by two joints **44**. The size and shape of the outer body **38** is not critical, but it is preferably sized and shaped to generally fit within the midsection **28** of the knife body Similarly, the size and shape of the inner body **42** is not critical, but it is preferably sized and shaped to fit within the inner opening **40** of the outer body **38**.

In the depicted embodiment, the outer body **38** of one side portion **36** includes two small protrusions **46** on the top of its inner surface **35**, as best shown in FIGs. 4 and 6. The outer body **38** of the other side portion **36** includes on the top of its inner surface **35** two corresponding protrusions **48**, each including a bore **50** adapted to receive one of the protrusions **46** of the other side portion. The protrusions **46** and **48** extend through the slot **30** in the knife body **14** and snap together to join the side portions **36** to each other on opposite sides of the knife body. Thus, in this embodiment, the protrusions **46** and **48**, which function as male-female connectors, form the top portion **34** of the blade cover **32**.

The protrusions **46** and **48** are sized to slide within the slot **30** so that the

blade cover **32** can be moved relative to the knife body **14**. In its default position, the blade cover **32** covers the knife blade **18**, as best shown in FIG. 1. To use the knife to cut an object, the user slides the blade cover **32** proximally to thereby expose the blade **18**.

Preferably a mechanism is provided for "locking" or maintaining the blade cover **32** in the default position where it is covering the knife blade **18**. In the depicted embodiment, the right and left sides **27** and **29** of the knife each include a distal notch **52** and a proximal notch **54**, as shown in FIG. 3 for the right side of the knife. The notches **52** and **54** are located at the same positions on the right and left sides **27** and **29** of the knife. The inner surfaces **35** of the inner bodies **42** of the side portions **36** of the blade cover **32** each include a corresponding protrusion **56**, as shown in FIGs. 4 and 5, that mates with the distal and proximal notches **52** and **54**. When the blade cover **32** is in the default position, the protrusions **56** rest in the distal notches **52** on the sides of the knife body **14**, thereby maintaining the blade cover in place over the blade **18**.

To move the blade cover **32** proximally to expose the blade **18**, one exerts pressure on the proximal ends of the inner bodies **42** of the side portions **36**, which, as noted above, are hingedly attached to the outer bodies **38** of the side portions. This pressure moves the proximal ends of the inner bodies **42** toward the knife body **14** and the distal ends of the inner bodies away from the knife body so that the protrusions **56** are freed from the distal notches **52** and the blade cover **32** can be slid proximally. When the blade cover **32** has been moved proximally a sufficient distance to expose the entire blade **18**, the protrusions **56** rest in the proximal notches **54** to "lock" or hold the blade cover in a position away from the blade. When the user wishes to cover the blade **18**, pressure is again exerted on the proximal end of the inner body **42**, thereby freeing the protrusions **56** from the proximal notches **54**. In the depicted embodiment, the proximal ends of the inner bodies **42** of the side portions **36** of the blade cover **32**

include a plurality of small ridges **58** to enhance the friction between the inner bodies and the user's fingers.

The blade cover **32** has a length at least equal to that of the blade **18**, and preferably slightly greater than that of the blade **18**. The knife blade **18** has an exposed length preferably ranging from about 1 cm to about 6 cm, more preferably from about 2 cm to about 4 cm, and the blade cover **32** has a length ranging from about 3 cm to about 8 cm, which can vary depending on the dimensions of the knife. Similarly, the two downwardly extending side portions **36** of the blade cover **32** have a height sufficient for the bottoms of the side portions to extend beyond the bottom of the knife blade **18**, as best shown in FIG. 6.

The size and shape of the slot **30** can vary so long as the slot extends into the knife body **14** a sufficient distance so that the blade cover **32** can be positioned in the slot and the two downwardly extending side portions **36** of the blade cover can completely cover the knife blade **18**. The slot **30** is preferably of sufficient length so that the blade cover **32** can be slid proximally away from the blade **18** so that the blade cover does not overlap or cover any part of the blade, and more preferably not overlap or cover any part of the bottom edge **22** of the knife body **14**.

The depicted knife also includes two elongated, preferably generally parallel, ridges **60** extending along each side of the midsection **28** of the knife body **14**, as best shown in FIG. 3. The ridges **60** assist in guiding the blade cover **32** when it is moved relative to the knife body **14**.

The knife of the invention is particularly suitable for scoring bread dough. In use, the baker slides the knife along the top of the dough with at least a portion of the bottom edge **22** of the knife body **14** in contact with the dough. The bottom edge **22** of the knife body **14** is curved or rounded, i.e. convex, so that it is generally U-shaped, as best shown in FIGs. 6 and 9. The curved bottom edge **22**

does not penetrate the dough, while the blade **18** creates a slash of appropriate depth. The bottom edge **22** of the knife is preferably also smooth to prevent the bottom edge from catching on and damaging the dough. As the knife reaches the end of the dough and the blade is pulled from the dough, the curved distal edge **26**, which extends beyond the distal end of the blade **18**, also does not penetrate the dough, but allows the knife to smoothly ease away from the dough. By this design, it is unnecessary for the user to determine how deep to insert the blade or how much pressure to place on the knife because only the blade (and not the body) enters the dough as the bottom edge of the knife is run over the dough. Notably, the user can view the scoring process from directly above the knife even though the blade is not in view because it is unnecessary for the user to see the placement of the blade to achieve the desired result.

The inventive knife is also useful for cutting corrugated boxes. In particular, the knife includes a small angled protrusion **64** extending outwardly from the distal end of the left side **29** of the midsection **28** of the knife body **14**, as best shown in FIGs. 1 to 3. The angled protrusion **64** includes an outer surface **66** that angles away from the body in a proximal direction. The angled protrusion **64** also includes a generally flat proximal surface **68**. In use, the blade cover **32** is slid proximally to expose the blade **18**, and the blade is used to cut, for example, three sides of a square in a panel of a corrugated box. The user can then push the cut panel forward (i.e., into the box) using the distal end of the knife, and then contact the flat proximal surface **66** of the angled protrusion **64** with the inside surface of the cut panel to thereby pull the cut panel outside the box. The angled outer surface **66** of the angled protrusion prevents the protrusion from catching on the cut panel as the knife is pushed distally into the panel and box.

An alternative embodiment of a knife according to the invention is shown in FIGs. 7 to 9, where like reference numerals indicate like parts unless

otherwise indicated. The knife has an elongated body **14** having a distal end region **14** having a blade **18** extending downward therefrom and a proximal end region **14** that essentially forms a handle for the user to grip the knife. The knife is generally S-shaped. The knife includes an elongated slot **30** extending through the midsection **28** along a portion of the length of the knife so that the slot does not contact either the proximal edge **24** or the distal edge **26**. A blade cover **32**, which is slidably mounted in the slot **30**, is generally in the shape of an upside-down "U" having a top portion **34** that extends through the slot **30** and two downwardly extending side portions **36** that extend from the slot, similar to the embodiment described above.

The blade cover **32** includes an arm **70** having an attachment end **72** flexibly attached to the top portion **34** and a free end **74** that carries an upwardly-extending tab **76**, which can be round (as depicted), square, rectangular or any other suitable shape. In the depicted embodiment, the attachment end **72** of the arm **70** is attached at an end of the blade cover **32**, although it can be attached anywhere along the length of the cover. The knife body **12** includes a distal notch **78** positioned at the top of the slot **30** shaped to receive the tab **76** when the blade cover **32** is positioned over the knife blade **18**. The knife body **12** also includes a proximal notch **80** positioned at the top of the slot **30** shaped to receive the tab **76** when the blade cover **32** is positioned proximal to the knife blade **18**. In use, when the blade cover **32** is positioned over the knife blade **18** and the tab **76** is received in the distal notch **78**, the user pushes down on the tab, thereby releasing the tab from the distal notch, and pushes the blade cover proximally away from the knife blade. The arm **70**, being flexibly attached to the top portion **34** of the blade cover **32**, tends to exert a force against the surface of the knife body that defines the top of the slot **30**. As a result, when the blade cover **32** is properly positioned away from the blade **18**,

the tab **76** is received by the proximal notch **80** and locked or held in place away from the blade.

Other locking mechanisms are contemplated within the invention. For example, one or more tabs (not shown) can extend downward from the top portion **34** of the blade cover **32** and match with one or more notches (not shown) along the bottom edge of the slot **30**.

The knife body **12** also includes two guide slots **92**, each on a side of the knife, that run generally parallel to at least a portion of the primary slot **30**. As shown best in FIG. 9, the downwardly extending side portions **36** of the blade cover **32** each include an inwardly extending tab **94**. The inwardly extending tabs **94** align with and fit inside the guide slots **92** to help guide the blade cover **32** as it is slid along the length of the knife body **12**. The tabs **94** can have any suitable shape. The guide slots can be eliminated or modified as desired in accordance with the invention.

In yet an alternative embodiment, the knife body has two slots **30** extending along its length, one on the right side **27** of the knife body and one on the left side **29**, as shown in Figure 10. In this embodiment, neither slot **30** extends all the way through the knife body **12**. Instead the slots **30** are separated from each other by a thin wall **82** having a thickness less than the thickness of the knife body **12**. Preferably the slots **30** on either side of the knife body have the same size and shape so that the slots are essentially mirror images of each other.

In this embodiment, the knife cover **32** is generally U-shaped, having two downwardly extending downwardly extending side portions **36**, a bottom portion **37** joining the side portions, and two top portions **34**, each top portion extending into a different slot **30**. As in the previous embodiments, the blade cover **32** has a length at least equal to that of the blade **18**, and the two downwardly extending side portions **36** have a height sufficient for the bottoms

of the side portions to extend beyond the bottom of the knife blade **18**. Thus, the bottom portion **37** is positioned below the bottom of the knife blade **18** when the cover is positioned over the knife blade. The top of the blade cover **32** comprises two inwardly extending top portions **39**, each of which extends into one of the two slots **30**.

In this embodiment, the blade cover **32** preferably includes two arms **70**, each being flexibly attached to the top of a different inwardly extending top portion **39** and carrying an upwardly extending tab **76**. The knife body **12** includes two distal notches **78** positioned at the tops of the two slots **30** shaped to receive the tabs **76** when the blade cover **32** is positioned over the knife blade **18**. The knife body **12** also includes two proximal notches **80** positioned at the tops of the slots **30** shaped to receive the tabs **76** when the blade cover **32** is positioned proximal to the knife blade **18**. This embodiment functions in a manner very similar to the previously-described embodiment, but the user needs to push down on two tabs **76** to release the blade cover **32** from a locked position.

The preceding description has been presented with references to presently preferred embodiments of the invention. Persons skilled in the art and technology to which this invention pertains will appreciate that alterations and changes in the described structures can be practiced without meaningfully departing from the principle, spirit and scope of this invention. Accordingly, the foregoing description should not be read as pertaining only to the precise structures described and shown in the accompanying drawings, but rather should be read as consistent with and as support for the following claims, which are to have their fullest and fairest scope.